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L6 and quantif$6	4

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IBM Technical Disclosure Bulletins

Search: L7

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Search History

DATE: Wednesday, March 15, 2006 Printable Copy Create Case

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DB=USPT; PLUR=YES; OP=ADJ			
L7	L6 and quantif$6	4	L7
L6	(5673703 or 5788648 or 5816247 or 5860936 or 6051209 or 6304775).pn.	6	L6
DB=PGPB,USPT; PLUR=YES; OP=ADJ			
L5	L3 and quantif$6 same indicat$3	0	L5
L4	L3 and quantif$6 same indicat$3 same patient	0	L4
L3	(5673703 or 5788648 or 5816247 or 5860936 or 6051209 or 6304775).pn.	6	L3
DB=USPT; PLUR=YES; OP=ADJ			
L2	L1 and respons$3 same threshold$3	15	L2
L1	marino.in.	871	L1

END OF SEARCH HISTORY

L7: Entry 4 of 4 File: USPT Aug 4, 1998

DOCUMENT-IDENTIFIER: US 5788648 A
TITLE: Electroencephalographic apparatus for exploring responses to quantified stimuli

Brief Summary Text (1):
The invention relates to electroencephalographic apparatus aimed at exploring a person's reactions and responses as expressed in the person's brainwave signals in response to various external quantifiable stimuli. In particular the invention is directed to generating such responses in quantified format and to generate correlation coefficients between the stimuli and the responses.

Brief Summary Text (6):
Applicant, however, is unaware of earlier explorations directed to the object of correlating quantitatively any connection between external stimuli and the brainwave responses of a human brain. In this context the range of interest is especially directed to the domain of quantifying a relation between various phases of external stimuli and resulting brain waves, but not limited to responses to quantifiable stimuli that can be expressed and measured quantitatively.

Brief Summary Text (7):
The invention is by extension also directed to the domain of quantifying a so-called auto-correlation between various phases of application of external stimuli.

Brief Summary Text (9):
The invention is directed to the art of expanding the art of exploring and analyzing a person's responses to stimuli, i.e. stimulations applied in the form of quantifiable stimuli including, but not limited to, external stimuli in the form of any one of and combinations of oral, visual, tactile, acoustic and/or olfactory stimuli. In accordance with the invention, there is provided electroencephalographic apparatus for exploring a person's response to external stimuli, which includes electroencephalographic sensing apparatus for sensing brainwave signals from the person; stimulating apparatus for generating the stimuli; and processing apparatus having at least a first input operative for receiving the brainwave signals, at least a second input for monitoring the stimuli; the processing apparatus including computing apparatus operative for computing a correlation quotient of the brainwave signals and the stimuli.

Brief Summary Text (12):
According to an additional feature, the quantizing apparatus includes a quantifier having an output coupled to the processing apparatus, wherein the processing apparatus includes a microprocessor, and a memory coupled to the processor for storing processing programs for the microprocessor.

Detailed Description Text (2):
In FIG. 1 a person 11 is coupled to an electroencephalographic processing arrangement 15 via a sensing apparatus 12, which can have different forms, e.g. as a sensing plate 12 disposed in close proximity to the brain of the person. The sensing device can have other forms, such as e.g. one or more electrodes 13 (FIG.

2) held in close contact with the head of the person 11. The output of the sensing device is coupled to an input of a sensitive preamplifier 17 having an output O connected to the processor 15. A stimulating arrangement shown here simply as an arrow 10 is arranged to apply one or more stimuli to the person. The stimuli can preferably be of a quantifiable type which can be measured and recorded numerically. Examples of stimuli are visual displays or light signals of different colors and intensities, oral instructions presented in a quantifiable manner which operate to make different impressions on the person 11, or tactile stimuli such as pressure applied in different magnitudes to some part of the person, or acoustic sounds which can be applied in different frequencies or intensities or olfactory stimuli which can be applied in the form of different types of smell of different intensities. A quantizing device, including essentially an analog measuring device connected to an analog to digital converter (A/D converter) measures and quantifies the stimuli and presents its digital output to the processor 15, in addition to the brainwave signal. In the processor 15 both the stimuli and the brainwave signals are processed through a Fourier transform 121, the algorithm for which is stored in memory (i.e. data base 123 of the processor. After being processed through the Fourier transform, the respective elements of the transform are processed in a correlation quotient transform algorithm 122, also stored in memory in the processor 15. The correlation coefficient produced by the correlation transform algorithm is a measure for the degree of correlation between the stimuli and the brainwave signals.

Detailed Description Text (14):
FIG. 4 is a flow-chart showing the steps of processing the correlation between stimuli and brainwave responses. In start step 300, a decision step 305 determines whether a correlation between stimuli and responses is to be performed from the NO output or an auto-correlation between subsequent phases of the output response is to be determined from the YES output. If the decision is NO, external stimuli are entered at step 301, followed by a frequency transposition of the brain waves and the stimuli to a higher frequency which will facilitate the following signal processing steps. In step 304 a Fourier transformation is performed on the brainwaves and the stimuli. The Fourier transforms of these signals is represented by respective series of Fourier coefficients that are computed by the Fourier integrals: ##EQU1## The correlation coefficient, usually designated by r, is computed in step 306 by the equation: ##EQU2## The resulting correlation coefficients as continuously computed are stored in memory in step 307 and, if necessary, encrypted in step 308, and outputted and distributed in step 309. If auto correlations are to be evaluated, it starts with output YES in decision step 305, followed by sensing subsequent early and late phase of the brainwaves, e.g. before and after application of stimuli, which in this case need not be quantifiable. Next, auto-correlations are evaluated in steps 302 . . . 309 as described above.

CLAIMS:

5. Apparatus according to claim 4, wherein said quantizing means include a quantifier having an output coupled to said processing means.

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☐ 1. Document ID: US 6304775 B1

L6: Entry 1 of 6 File: USPT Oct 16, 2001

US-PAT-NO: 6304775
DOCUMENT-IDENTIFIER: US 6304775 B1

TITLE: Seizure warning and prediction

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. D

☐ 2. Document ID: US 6051209 A

L6: Entry 2 of 6 File: USPT Apr 18, 2000

US-PAT-NO: 6051209
DOCUMENT-IDENTIFIER: US 6051209 A

TITLE: Determining effects of external stimuli on the brain using pet

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. D

☐ 3. Document ID: US 5860936 A

L6: Entry 3 of 6 File: USPT Jan 19, 1999

US-PAT-NO: 5860936
DOCUMENT-IDENTIFIER: US 5860936 A
** See image for Certificate of Correction **

TITLE: Method and apparatus for measurement, analysis, characterization, emulation, and translation of perception

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. D

☐ 4. Document ID: US 5816247 A

L6: Entry 4 of 6 File: USPT Oct 6, 1998

US-PAT-NO: 5816247
DOCUMENT-IDENTIFIER: US 5816247 A

TITLE: Monitoring an EEG

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D

☐ 5. Document ID: US 5788648 A

L6: Entry 5 of 6 File: USPT Aug 4, 1998

US-PAT-NO: 5788648
DOCUMENT-IDENTIFIER: US 5788648 A

TITLE: Electroencephalographic apparatus for exploring responses to quantified stimuli

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D

☐ 6. Document ID: US 5673703 A

L6: Entry 6 of 6 File: USPT Oct 7, 1997

US-PAT-NO: 5673703
DOCUMENT-IDENTIFIER: US 5673703 A

TITLE: Apparatus for automated determination of low frequency tactile thresholds

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D

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